

What is claimed:

1. An apparatus for delivering acoustic energy to a target site, comprising:  
a structure; and  
a transducer secured to the structure, the transducer having a surface

5 configured to be placed on a tissue, the structure comprising a channel located adjacent the transducer and adapted for carrying cooling fluid.

2. The apparatus of claim 1, further comprising a fluid source in fluid communication with the channel.

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3. The apparatus of claim 2, the structure comprising one or more lumens in fluid communication with the fluid source and the channel.

4. The apparatus of claim 1, further comprising a heat exchanger for cooling

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5. The apparatus of claim 1, the structure comprising a harness.

6. The apparatus of claim 5, the harness carrying a sensor configured for

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7. The apparatus of claim 1, the structure comprising a catheter.

8. The apparatus of claim 1, the structure comprising a handle.

9. The apparatus of claim 1, further comprising an acoustic energy sensor  
5 secured to the structure adjacent the transducer.

10. An apparatus for delivering acoustic energy to a tissue region, comprising:  
a catheter having a distal end, a proximal end, and a lumen extending  
there between;

10 a transducer secured to the catheter distal end and configured to deliver  
acoustic energy to a tissue region; and  
means for cooling the catheter distal end.

11. The apparatus of claim 10, the means for cooling comprising a channel  
15 located adjacent the transducer and a fluid source in fluid communication with  
the channel.

12. The apparatus of claim 10, further comprising a neurological signal sensor  
secured to the catheter distal end.

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13. The apparatus of claim 10, further comprising an acoustic energy sensor  
secured to the catheter distal end.

14. A method for performing ultrasound therapy in a target tissue region of a patient, the method comprising:

placing a transducer on a tissue surface;

5 delivering a blood thinning agent to a target tissue region underlying the tissue surface;

delivering acoustic energy from the transducer to the target tissue region thereby causing dilatation of a vessel in the target tissue region; and

cooling the tissue surface to remove heat generated from the delivered  
10 acoustic energy.

15. The method of claim 14, wherein the tissue surface comprises a skin surface.

15 16. The method of claim 14, wherein the tissue surface comprises dura tissue.

17. The method of claim 14, wherein the tissue surface a surface of an internal organ.

20 18. The method of claim 14, wherein the delivered acoustic energy is at a frequency between about two MHz and about ten MHz.

19. The method of claim 14, wherein the target tissue region comprises a brain vessel.

20. The method of claim 14, further comprising recording a neurological signal  
5 before or during the delivery of acoustic energy.

21. A method for delivering acoustic energy to a tissue region within a body, the method comprising:

introducing a structure carrying a transducer into a body;  
10 delivering acoustic energy to the tissue region.  
cooling a tissue adjacent or within the tissue region to reduce heat that is generated from the delivered acoustic energy.

22. The method of claim 21, further comprising delivering a blood thinning  
15 agent to the tissue region prior to delivering the acoustic energy.

23. The method of claim 21, further comprising sensing a reflected acoustic signal that is associated with the delivered acoustic energy.

20 24. The method of claim 23, further comprising analyzing the reflected acoustic signal to determine a location of a vessel.